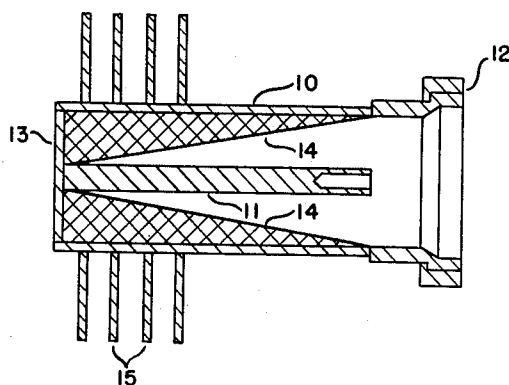


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G. L. RAGAN ET AL
COAXIAL LINE TERMINATING DEVICE

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INVENTORS
GEORGE L. RAGAN
JOHN REED

BY

William D. Hall

ATTORNEY

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COAXIAL LINE TERMINATING DEVICE

George L. Ragan, Cambridge, and John Reed, Belmont, Mass., assignors, by mesne assignments, to the United States of America as represented by the Secretary of War

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1 Claim. (Cl. 333-22)

1

This invention relates in general to electrical apparatus and more particularly to a means for terminating a coaxial line to enable dissipation of radio frequency energy passing therein.

In the development and testing of radio frequency equipment it is frequently desirable to provide a terminating impedance which may be connected at one end of a coaxial line to reflect the same impedance that an infinite line would reflect. It may also be desirable to dissipate the radio frequency energy in the form of heat to prevent it from radiating and producing interference with other radio frequency apparatus.

A load or terminating impedance having the same characteristics as an infinite line would produce a standing wave ratio of unity, i. e. no reflections would be produced by said load.

It is an object of this invention to provide a novel apparatus for the dissipation of radio frequency energy.

It is a further object of this invention to provide a novel means for terminating or loading a coaxial line to enable dissipation of the R.-F. energy with a minimum amount of reflections of said energy, thus making the standing wave ratio of the coaxial line substantially equal to unity.

Other objects, features and advantages of this invention will suggest themselves to those skilled in the art and will become apparent from the following description of the invention taken in connection with the accompanying drawing which is a cross-sectional view of an apparatus embodying the principles of this invention.

Referring now more particularly to the drawing, outer conductor 10 and inner conductor 11 are the normal elements of a coaxial line. On one end of the coaxial line a standard coaxial connector 12 is mounted. Inner conductor 11 is hollow for a portion of its length to permit the male portion of the coaxial connector to enter and make connection therewith. On the other end of the coaxial line a shorting disk 13 is fastened, thereby shorting the outer conductor 10 to the inner conductor 11. A material affording high loss of R.-F. energy, such as powdered iron dispersed in a binder, is disposed between conductors 10 and 11 as indicated at 14. Lossy material 14 is tapered, i. e. the coaxial line at the end where disk 13 is mounted is completely filled and said lossy material tapers, becoming thinner toward the end where the coaxial connector 12 is mounted. Cooling fins 15, constructed of copper or similar material of high radiating efficiency, are mounted around the outside of conductor 10 to prevent the lossy material from becoming overheated.

In operation, radio frequency energy passing along the coaxial line 10 encounters the lossy material where it is dissipated in the form of

2

heat. By making the lossy material increase in diameter, i. e. afford decreasing air passage for the radio frequency energy between the inner and outer conductors, reflections of the radio frequency energy are minimized. The lossy material is usually made long in relation to the wavelength of the radio frequency energy for which it is to be used thus producing a low standing wave ratio along the coaxial line over a wide frequency band.

While there has been described what is at present considered to be the preferred embodiment of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the scope of the invention.

The invention claimed is:

A device for terminating a coaxial line, comprising a coaxial section having inner and outer conductors, means for short circuiting said outer conductor to said inner conductor at one end of said conductors, the other end of said conductors being adapted to be connected to said coaxial line, an energy dissipative tapered plug composed of powdered iron disposed in a binder, said plug being disposed between said outer and inner conductors with its entire outer surface secured to the inner surface of said outer conductor, said plug having one end thereof disposed at said one end of said conductors with its inner surface at its one end having a diameter equal to the outer diameter of said inner conductor, the inner surface of said plug at its other end having a diameter substantially equal to the inner diameter of said outer conductor, the thickness of said energy dissipative means varying from a maximum at said one end thereof to a minimum at said other end thereof, said plug having a length that is long relative to the wavelength of the energy to be conducted by said coaxial line, and cooling fins radially secured to said outer conductor for dissipating the heat energy generated in said energy dissipative plug.

GEORGE L. RAGAN.
JOHN REED.

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